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# Perception of implementation processes of green logistics in SMEs in Slovakia

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**Abstract**

Green logistics focuses on the impact of corporate processes on the environment. The implementation of the green logistics processes into SMEs is a way of building good reputation while at the same time ensuring sustainable development of business. This paper deals with green logistics in Slovak small and medium enterprises, and presents the results of a survey the main objective of which was to explore the initiatives of green logistics in the conditions of Slovak SMEs, and to identify the opportunities and the barriers of implementing the logistics processes into SMEs in Slovakia. On basis of the survey results, we would like to suggest an algorithm of implementation of the green logistics processes in the conditions of the Slovak SMEs.



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*Keywords:* Green logistics, Logistics processes, Small and medium enterprises (SME), Sustainable development

## 1. Introduction to the problem

Nowadays, when the business world has become highly globalized, managers and leaders of companies have realized the importance of having a competitive advantage within the global market, not only the national one (Bencikova, 2013). The environment is an important factor which currently influences the activities of enterprises, as well as the processes of planning and implementation of corporate strategies. New market opportunities are opening, along with possibilities to profit in areas and places where protection of the environment is required (Musova, 2013). Traditional marketing activities of enterprises in contemporary turbulent environment do not have the required effect, and the enterprises are therefore forced to seek new ways of reaching their objectives. One of these ways is to emphasize the environmental aspects of entrepreneurship (Krizanova, Majerova, Zvarikova, 2013). An appropriate

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response to changes, as well as effective actions, makes a difference between successful and unsuccessful companies (Elexa, 2009). Quality requirements for goods and services are considered at the same level and according to the same criteria in large, medium, and small enterprises. The reason is that quality of goods guarantees customer satisfaction, as well as success of the enterprise (Klementova, Sedliacikova, 2014). However, to maintain a competitive position in the market, it is not sufficient to only focus on keeping a high quality of products and services. Producers are forced to continuously search for new opportunities and possibilities of product improvements (Klement, 2009). Present time can be characterized by rapidly changing conditions of the environment that surrounds us. If we want to be successful, we need to quickly respond and adapt to these changes (Bencikova, Minarova, 2011).

Within the given context, the objective of the authors is to pursue the problem of green logistics in more detail in this paper, as green logistics has currently been gaining more attention and importance. It is green logistics that leads to changes in creating the product value, as it is directed at measuring and minimizing the ecological impact of logistics activities, and at the same time places emphasis on sustainable environmental orientation of enterprises. After defining the problem from the theoretical point of view, we focus our attention on presenting chosen results of our research, the main objective of which was to find out how small and medium enterprises in Slovakia perceive the activities of green logistics. On basis of the results of our research, we present a proposal of an algorithm of processes of green logistics in small and medium enterprises (SMEs) in Slovakia.

## 2. Theoretical foundations

Logistics represents a continuously developing process, which is constantly in progress. Logistics is an organization, planning, managing, and a performance of the goods flow – beginning with its development and purchase, ending with production and distribution, according to the final customer – in such way that all requirements of the market are met at minimum costs and minimum capital expenditure. Poliacikova (2007) considers logistics to be an element of distribution, which is focused on optimization of total distribution costs, as well as the quality of customer service, related to the whole process from placing the order, through storage, supply management and handling, to final shipment to the consumer. A contemporary customer is experienced, impatient, and he/she likes to choose between more options. Satisfied customers come back and make new purchases, and therefore customer satisfaction represents one of the main pillars of long-term trade successes (Badura, 2002). Enterprises can thus convince customers by applying suitable logistics strategies, which enable them to obtain the competitive advantage, and achieve the profit growth. (Minarova, 2011) When creating a logistics network, it is essential to also incorporate the demands, requirements and priorities of customers, along with the need to protect the environment, through continuously monitoring and evaluating the quality of the individual elements of the whole logistics network. Apart from other factors, the determination of quality of the logistics network elements reveals problematic areas which must be dealt with at high priority. (Nedeliakova, Klementova, 2013, p. 333) In long term, lowering the costs of raw materials and production motivates the consumer to consuming without feeling guilty, while at the same time sustainable development is guaranteed. Such concept is looked upon very positively and is accepted not only by the enterprises, but also by the ecologists (Badura, Gubova, 2015).

## 3. Research methodology

In primary research we used the questioning method of a questionnaire. The main objective of our research was to find out how small and medium businesses in Slovakia perceive the activities of green logistics, and identify factors which make these enterprises implement them. The questionnaire was sent to 500 randomly chosen SMEs in Slovakia, while we received 309 filled-in questionnaires. For the purposes of this paper, we have used 250 correctly filled-in questionnaires to evaluate the results. Representativeness of the sample according to chosen attributes – size of enterprise, which was determined on basis of the number of employees and the industry, was tested by means of the Chi-quadrat test. In both cases, representativeness was proved, as the p value was higher than the statistical significance $\alpha = 0,05$. When evaluating the results of the research we used methods of testing statistical hypothesis (Chi-quadrat test, Friedman test, and Wilcoxon test), and methods of descriptive statistics and data visualization (mean, modus, median, and frequency tables). By means of the Chi-quadrat method, we tested representativeness of

the sample according to chosen attributes. Friedman test verifies the median agreement for k (k>2) attributes with the same categories, i.e. for k dependent choices with the same extent n (Kascakova, Nedeľova, 2010, p. 31). Wilcoxon (Mann-Whitney) test is stronger for verification of equality of two independent choices in comparison with a median test. It verifies the hypothesis $H_0$: F(x) = G(y) $H_1$: F(x) ≠ G(y) (Kascakova, Nedeľova, 2010, p. 32).

## 4. Results and discussion

For the purposes of this paper, we have evaluated the questionnaires obtained at 250 SMEs in Slovakia, while our sample consisted of 248 small and 2 medium enterprises. As to the industry, the following percentage of respondents participated in our research: 3.6 % of enterprises in the field of agriculture, 13.6 % in heavy machinery industry, 18 % in building industry, 27.2 % in trade, and 37.6 % in service industry. Most enterprises, 37.2 %, have a turnover between €10,001 -100,000, and operate at a regional market (28 %).

On basis of Friedman and Wilcoxon tests we have found out that SMEs in Slovakia mostly agree with the statement that 'green logistics is the ecological way of transporting materials and goods, as well as using environmentally friendly packaging'. The lowest numbers of respondents understand green logistics as 'optimum management of supplies and environmental system of quality management'. For us a very interesting finding was that out of the number of activities of green logistics, most SMEs in Slovakia are engaged in separating and recycling waste, while at the same time trying to decrease the material demands of production. The activity they are least engaged in is providing training in the field of green logistics to their employees. Among those activities of green logistics that are not implemented by Slovak enterprises, are: choosing environmentally suitable suppliers, using environmental ways of transportation, and using alternative sources of energy. Since as much as 70 % of Slovak SMEs who participated in our research, stated that they do not educate their employees in this field, and 54 % do not plan to do so, we can say that the implementation of the activities of green logistics is not attractive for Slovak SMEs, as it is primarily the employees who are responsible for carrying out these activities.

On basis of the Wilcox test we can say that in the field of green logistics, SMEs in Slovakia put most emphasis on optimization of transportation routes and effectiveness of loading the transported goods. Such activities of green logistics as use of alternative fuels in transportation, use of renewable sources of energy, gathering information about consumption of energy and $CO_2$ emissions, certification in the environmental field, cooperation with partners and customers with the purpose to reach environmental objectives, and environmental education of employees and customers, are not even planned for implementation. We have proved that the enterprises in Slovakia only engage in the basic activities of green logistics, and do not perceive green logistics as a tool with the help of which they may achieve a competitive advantage and thus ensure their stable position in the market.

The same has also been proved by evaluating the question aimed at determining the barriers to implementation of processes of green logistics. Most respondents agreed with the statement that 'it is the high input investment costs that represent the barrier (156 respondents). High agreement rate was also obtained at uncertain return of the investment (103 respondents), insufficiency of financial resources (111 respondents) and lack of support from the state (113 respondents). We can state that shortage in financial sources represents the largest barrier for implementation of processes of green logistics in Slovak SMEs. On the other hand, suitable education and training of employees could be ensured by implementation of such processes of green logistics as e.g. choice of environmentally suitable suppliers, effective placement of the production equipment within the enterprise, ecological way of transportation, gathering information about emissions and energy consumption, reduction of the amount of packaging material, or cooperation with customers, which are often not so financially demanding, and may save the costs related to transportation, material handling, production, as well as losing a customer, which each enterprise encounters.

Based on the results of our research, we may state that SMEs in Slovakia currently perform a very small number of activities of green logistics. Lack of financial resources has been identified as the biggest barrier. At the same time, enterprises are not interested in educating their employees in this field, which could, in our opinion, enable them to make the processes these employees are responsible for more effective. In many cases, it is not the financially demanding investments that matter in implementing the activities of green logistics, but it is the lack of interest in education in this field, which leads to inefficient implementation of processes in an enterprise, and finally to loss of financial sources that could be invested into the activities of green logistics.

## 5. Implementation of processes of green logistics into SMEs in Slovakia

The objective of our research was to analyze various factors which affect implementation of initiatives of green logistics in Slovak SMEs. On basis of the results of our research, we propose several options how to implement the initiatives of green logistics into Slovak SMEs, with the purpose of adjusting to future expectations of customers, as well as responding to the growing global and competitive environment.

One of the main starters of implementation of initiatives of green logistics into SMEs is the customer pressure, and the decisions of the top management. By adopting the initiatives of green logistics in SMEs, the enterprises attempt to maintain the current, as well as obtain new, customers. Besides this fact, participation of top management has a direct effect on how well the initiatives of green logistics will be accepted by the employees, who are the main source and executors of these initiatives.

The main barriers to implementation of initiatives of green logistics are the financial and economic factors. Another factor is customers, who on one hand expect these initiatives, but on the other, are not willing to pay for green initiatives, and at the same time their requirements in the given field are unclear.

It is essential to put emphasis on the added environmental value (e.g. voluntary environmental activities exceeding the frame of the basic responsibilities, given by the legislature), which not only brings the higher environment protection, but also higher competitive advantage for those SMEs which decide to take this path (e.g. by higher demand for performance of an environmentally-behaving enterprise on the customers' side).

On basis of the result of our research, we propose the following algorithm of implementation of green logistics in Slovak SMEs.

The first step is the external analysis, which will provide SMEs with information about the needs of their customers. This will enable them to aim their innovations towards the initiatives of green logistics, on basis of customer segmentation, as well as their 'green' awareness and willingness to pay for these initiatives.

The next step will be the internal analysis of possibilities of the SME to provide new services in the given field, which will distinguish them from their competitors. It is very important to create new offer of services for customers, from the point of view of a new situation in the enterprise, since each enterprise has limited disposable resources.

On basis of the findings of the internal and the external audits and its comparison, a SME will identify its strengths, opportunities for improvement, as well as potential risks. The third step is based on identification of needs of new partners, and the potential for development of knowledge in the field of initiatives of green logistics.

In the fourth step, SMEs answer the question how the implementation of the chosen initiatives of green logistics will reflect in the price list of the SME. It is essential to choose a suitable method of integration of initiatives of green logistics into the prices of products and services. SMEs can perceive increasing the investments into green logistics as increasing the value of their product, and thus achieve larger market share. Alternatively, SMEs may follow the prices of their competitors, and try to adjust the product price to the market prices. From the point of view of implementation of initiatives of green logistics, the first model appears to be more effective, as it focuses on supporting these investments.

If the enterprise is interested in implementing the initiatives of green logistics, in the next step it is important to enable the organizational support and suitable human resources. It is inevitable to plan the courses/workshops, and educate the employees in order to raise their awareness and knowledge in the field of environment.

The last step is oriented at development of supportive information and communication technologies.

## 6. Conclusion

Recently, the pressure on the implementation of codes of ethics in small and medium enterprises has been growing stronger, and this can lead to the improvement of the business environment (Satanova, Sedliacikova, 2014). If the small and medium enterprises are interested in making their processes more ecological, at the beginning it is important to focus on implementation of initiatives of green logistics into such corporate strategies which will enable their implementation in the whole enterprise, and will have a positive impact on the offer of products and services. For this to happen, enterprises must discover how to initiate the human ability to learn at all levels (Minarova, Cierna,

2008). This will enable SMEs to differentiate from their competitors and will guarantee satisfied and loyal customers.

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